

US EPA ARCHIVE DOCUMENT

E213

file

122804

Shaughnessy Number: 122804

Date out of EAB: JUN 23 1988

TO: GEORGE LARocca
Product Manager 15
Registration Division (TS 767C)

FROM: Paul Mastradone, Ph.D. *PM*
Acting Chief, Review Section 1/EAB/HED (TS769-C)

THRU: Paul F. Schuda, Chief
Exposure Assessment Branch/HED (TS 769C) *Paul F. Schuda*

Attached, please find the EAB review of...

Reg./File #:8F3592, 8H5550

Chemical Name:AVERMECTIN

Type Product:INSECTICIDE

Company Name:MERCK

Purpose: REGISTRATION FOR USE ON CITRUS

Date Received 12/23/87 Action Code:180

Date Completed: EAB #(s): 80268

Monitoring Study Requested: Total Reviewing Time: 3 days

Monitoring Study Volunteered:

Deferrals to: ☐ Ecological Effects Branch
☐ Residue Chemistry Branch
☐ Toxicology Branch

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1. CHEMICAL: AVERMECTIN
2. TEST MATERIAL: 0.15 EC Formulation.
3. STUDY/ACTION TYPE: Registration for use on citrus.
4. STUDY IDENTIFICATION: Accession 404430-11,12
SOIL RESIDUE DATA IN SUPPORT OF REGISTRATION FOR USE OF
AVERMECTIN ON CITRUS.

5. REVIEWED BY:

Typed Name: A. ABRAMOVITCH, Ph.D.
Title: Chemist, Review Section 1
Organization: EAB/HED/OPP

Date: JUN 23 1988
Signature: *A. Abramovitch*

6. APPROVED BY:

Typed Name: P. MASTRADONE, Ph.D.
Title: Acting Chief, Review Section 1
Organization: EAB/HED/OPP

Date: JUN 23 1988
Signature: *Paul J. Mastradone*

7. CONCLUSIONS:

The field dissipation data requirement for use on citrus remains unsatisfied. The registrant did not address the vertical movement of avermectin residues to depths below 6 inches. The leaching potential of avermectin to the 6 inch depth was not addressed under worse case situation/actual use conditions due to absence of irrigation/rainfall after application to induce movement.

8. RECOMMENDATIONS:

The field dissipation in a citrus grove study should be repeated with sufficient irrigation immediately after application to simulate actual use conditions. The registrant may choose to address the leachability issue by conducting a small scale prospective ground water monitoring study. A ground water monitoring study should be more appropriate since the analytical method with a sensitivity of 1 ng/g in soil might not be sensitive enough to trace avermectin in soil. Also, since photodegradation on the soil surface is rapid, a soil column leaching study on the photoproducts is recommended.

9. BACKGROUND:

All the laboratory environmental fate data requirements on avermectin were satisfied. EAB have concured with an EUP on citrus in their review of April 16, 1987. The label attached to the April, 1987 review calls for a maximum yearly application rate of 0.025 lb ai/acre. A label was not enclosed with this submission.

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10. DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:

Study Identification:

Soil Residue Data in Support of a Registration/Petition for the use of Abamectin on citrus. John M. Morgan, Jan. 29, 1986.

Materials and Methods:

Three separate one acre soil plots in a Sunshine Villas, Lake County, Florida, were treated with four applications of 0.15 EC avermectin to levels of 0.025 and 0.05 lb ai/acre. Spraying was done with a commercial air blast to simulate actual use conditions. Soil samples were taken at -1, 0, 1, 3, 7, 10, 28, 53, and 90 days after the final application to 0-2 and 2-4 inch depths. The 53 and 90 days soil samples were taken to the 4-6 inch depth. Analysis was conducted using Merck method 3005 with a limit of detection of 1 ng/g.

Reported Results:

Summary of Recoveries from Control Soil Samples Fortified with Avermectin B1a

ABC Lab Number	Merck Sample I.D. Number	Fortification Level ng/g Avermectin B1	Avermectin B1 ng/g Determined	Percent Recovery %
001-84-007R-				
2	1	1	0.81	81
102	91	1	0.68	68
122	109	1	0.92	92
152	136	1	0.76	76
162	145	1	0.67	67
182	163	1	0.87	87
192	172	1	0.81	81
MEAN ± REC=				78.9 ±
R.S.D.=				12 ±
12	10	5	3.2	64
22	19	5	3.8	76
42	37	5	4.5	90
62	55	5	4.8	96
82	73	5	5.4	108
92	82	5	4.2	84
112	100	5	4.7	94
42R	37	5	4.0	81
42R *	37	5	3.2	64
142	127	5	3.8	75
172	154	5	3.6	73
MEAN ± REC=				82.3 ±
R.S.D.=				17 ±
32	28	10	8.6	86
52	46	10	6.5	65
72	64	10	7.7	77
MEAN ± REC=				76.0 ±
R.S.D.=				14 ±

* The second half of the fortified control was analyzed.

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Avermectin science review

Page _____ is not included in this copy.

Pages 4 through 8 are not included in this copy.

The material not included contains the following type of information:

- ☐ Identity of product inert ingredients
 - ☐ Identity of product impurities
 - ☐ Description of the product manufacturing process
 - ☐ Description of product quality control procedures
 - ☐ Identity of the source of product ingredients
 - ☐ Sales or other commercial/financial information
 - ☐ A draft product label
 - ☐ The product confidential statement of formula
 - ☐ Information about a pending registration action
 - ☒ FIFRA registration data
 - ☐ The document is a duplicate of page(s) _____
 - ☐ The document is not responsive to the request
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The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

Study Author's Conclusions:

The study author concluded that avermectin dissipated rapidly in the top 0-2 inch soil and only 1.5 ng/g were detected on day 1 with the 0.025 lb ai/acre application rate. With 0.05 lb ai/acre application rate, 29 ng/g were detected at the 0-2 inch level on day 0 and 1.9 ng/g on day 1. The average recoveries were 79% at the 1 ng level, 82% at the 5 ng level and 79% at the 10 ng level for fortified samples. Avermectin was not detected above the detection limit of 1 ng/g at the 2-4 inch depth at any time..

Reviewer's Discussion and Interpretation of Study Results:

The study does not properly address the dissipation and movement of avermectin in the Florida citrus grove and does not satisfy the field dissipation data requirement for use on citrus. In particular, the vertical movement of avermectin in soil was not addressed. Soil samples were taken only to the 6 inch depth and in most cases only to the 4 inch depth. Weather conditions were not reported and rainfall/irrigation data were not provided. In fact, soil moisture was reported to be very low at the 1% level. In absence of rainfall/irrigation, no movement of avermectin can be anticipated. It appears that under the experimental conditions, avermectin degraded rapidly under exposure to the June Florida sun (temperatures were not reported, photodegradation is a major route of degradation). Therefore, avermectin was detected at low levels at the top 0-2 inch soil soon after application inspite a 0 time application rate of about 36 ng/g for the top soil and a detection limit of 1 ng/g. The registrant was unable to explain abnormally high avermectin residues for days 28 for both trials and attributed them to contamination. In absence of rainfall/irrigation after application, the reviewer cannot evaluate the data properly or attribute dissipation in the top soil to translocation. In order to determine the extent of vertical mobility, a study should be conducted to a minimum of 12 inch depth and sufficient irrigation should be applied immediately after application.

11. COMPLETION OF ONE-LINER: Not completed.
12. CBI APPENDIX: None.